

Membrane technology expands into
many small-scale applications
Page 25

7/13/88

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CHEMICAL & ENGINEERING

NEWS



International AIDS Conference

Slow progress reported
despite intensive research Page 7

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News of the Week

■ A newly released Congressional report contends that U.S. space technology is holding its own when compared with that of the Soviet Union. **Page 4**

■ Koppers' chemical unit is being sold to a management group from Koppers and Gordon Cain's Sterling Group; Cain will be chairman of the new company. **Page 5**

■ Research in several institutions advances understanding of the role calcium plays in the biochemistry of vision. **Page 5**

■ Eligible veterans will begin to receive agent orange settlement payments early next year, following Supreme Court removal of final legal roadblocks. **Page 6**

■ Department of Energy report says cost of cleaning up DOE's nuclear test sites to comply with environmental laws will be \$45 billion to over \$70 billion. **Page 6**

Letters	2
Editor's Page	3
Concentrates	
Business	15
Government	19
Science/Technology	22
The Departments	
Meetings	35
Awards	52
Newsclips	72

Business

U.K. lead alkyls producer **Associated Octel** is moving to diversify in face of phaseout of use of lead alkyl antiknock compounds in gasoline. **Page 16**

Government

Recommendations for accelerating the usefulness of superconductivity are outgrowth of recent Congressional hearings, Office of Technology Assessment report. **Page 20**

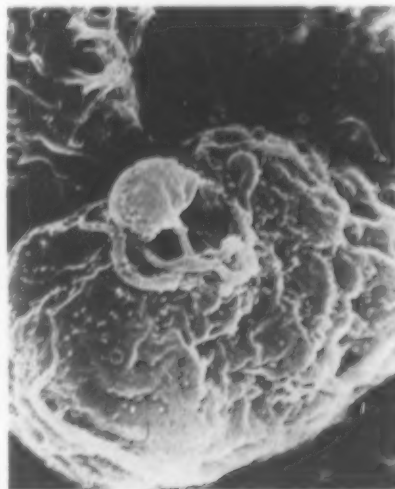
Charges of criminal violations in the handling and disposal of hazardous wastes have been brought against three Department of Defense chemical engineers. **Page 21**

Technology

New membrane technologies are having a growing impact on small-scale processing in the biotechnology, chemical, and petrochemical industries. **Page 25**

Books

"The Toxic Cloud" by Michael H. Brown, a harrowing account of our nation's air quality, sounds a shrill alarm for action. **Page 33**



News Focus

Much has been learned about AIDS in a very short time, but scientists at the 4th International Conference on AIDS, held last month in Stockholm, state clearly that the most difficult work lies ahead—finding effective therapy for the disease or developing a vaccine against it. **Page 7**

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LETTERS

Stereotyping hurts

SIR: I would like to thank Erica Harvey for her well-reasoned, well-researched, and timely letter (C&EN, May 30, page 2) concerning C&EN's stereotyping of women as mindless sex objects and self-centered consumers. It is surely time for ACS and its publications to become sufficiently sensitive to the human condition to realize that stereotyping hurts. Blatantly false stereotyping hurts a lot.

Your treatment of women hurts both men and women and helps perpetuate the false picture you present. Some men are mindless sex objects and self-centered consumers. Some women are scientists and social leaders. It is not asking too much of you to ask that you respond to Harvey's letter by doing what you should have done already: Keep C&EN's pages free of the business-as-usual prejudice that is so common in our society that we are not even supposed to notice it.

Edward McC. Roberts
North Tarrytown, N.Y.

Energy efficiency

SIR: Walter Pittman should follow his own advice and undertake a "modicum of research (with an open mind)" (C&EN, May 23, page 2). If he had done so, he would have concluded that energy efficiency, not nuclear power, exacts the least cost in human lives and pocket-books of all energy services.

Since Congress mandated least-cost utility planning in the four northwestern states in 1980, that region has shelved plans for virtually all of the 16 planned coal and nuclear power plants. Why? The region found an abundance of energy efficiency investments at far below the cost of building power plants. Nationwide, efficiency improvements have displaced the equivalent of 14 million barrels of oil per day since 1973, saving Americans over \$130 billion on yearly energy bills. Recent Congressional testimony shows that those impressive savings can be doubled over the next decade or so through the further use of highly efficient lights, motors, and appliances.

The savings worldwide are equally staggering. The newly published "Energy for a Sustainable World" by Goldemberg et al. indicates multitrillion dollar savings by relying on efficiency over the next half century. As a result, coal combustion would decline 20% instead of rising 2 to 3.5 times and nuclear power would level out at 460 gigawatts(e) instead of climbing to between 2200 and

3700 GW(e). In the former case, acid rain and global warming would be somewhat mitigated; in the latter, several million kilograms of weapons-grade plutonium would not be produced.

Claudine Schneider
Member of Congress
2nd District, Rhode Island

Chitin and chitosan

SIR: Joseph Nagyvary's special report, "The Chemistry of a Stradivarius" (C&EN, May 23, page 24), comments on the use of chitin in violin construction.

The commercial production of this polymer has been fostered by the national Sea Grant program and there are now a number of fledgling manufacturers in the U.S. as well as around the world. Exciting new applications are continually being discovered, particularly in the biomedical area. However, development has been slowed because many potential users are ignorant of the existence of this unique polymer and its close relative, chitosan.

Unfortunately, this situation is likely to persist if authors like Nagyvary do not make clear the difference between chitin and chitosan. Both polymers have a poly- β -D-glucosamine backbone, but while chitin is highly acetylated on the amino groups, chitosan is substantially deacetylated. These differing degrees of acetylation make the essentially neutral chitin totally insoluble in boiling water or vinegar. On the other hand, basic chitosan dissolves readily in dilute acetic acid (vinegar) to afford a powerful, film-forming, wood adhesive or varnish.

It therefore seems more likely that chitosan, rather than chitin, was used in the manufacture of violins. The fabled misinformation tradition of luthier Guadagnini and patron Count Cozio di Salabue apparently lives on in Texas.

G. Graham Allan
Professor of Fiber and Polymer Science
University of Washington, Seattle

Inspired by Steele

SIR: I was surprised, pleased, and fascinated to learn that Arnold Beckman was inspired as a 9-year-old by one of Steele's books on chemistry (C&EN, May 9, page 40). I, too, was inspired at an early age by one of Steele's books.

This excerpt appears in a personalized history of the invention of the heart lung machine that my wife, Eleanor, and I wrote a few years ago: "I probably would have done more in woodworking

Continued on page 52

High court lets agent orange settlement stand

With final legal roadblocks removed by the Supreme Court, some Vietnam veterans can look forward to receiving compensation for exposure to agent orange during their tours there.

On June 30, the justices declined to hear objections to a May 1984 settlement between most veterans seeking compensation for agent orange exposure and the seven chemical companies that manufactured the herbicide during the war. This was the last of several challenges to the settlement. Under the original settlement, the companies agreed to a \$180 million compensation figure. But compound interest has raised that total to about \$240 million.

The plaintiffs wanted to continue their suit against the companies. But the high court let stand a lower court ruling that the companies were immune from further liability in this instance. About 2400 veterans chose not to take part in the original settlement, but they are eligible to receive benefits from the fund.

Judge Jack B. Weinstein of the Federal District Court in Brooklyn, who heard the agent orange case and helped develop the settlement plan, indicated that payment to veterans will begin early next year. Of nearly 250,000 claims on the settlement, about 40,000 to 60,000 veterans may be eligible for payments. Of the funds available, \$170 million will provide cash benefits to veterans considered totally disabled and to the families of veterans whose deaths have been linked to agent orange. Average payments are expected to be about \$5700, but may be as high as \$12,000. Death benefits go up to \$3400.

Of the remaining funds, \$52 million will be set aside for social service projects to help veterans and their families, and \$5 million will go to Australian and New Zealand personnel exposed to agent orange. Attorneys' fees and other costs for the litigation are pegged at \$13 million.

Agent orange toxicity is one of today's most prominent scientific controversies. Studies have shown little or no link between exposure

and pathology, but research efforts by the Air Force and the National Institute for Occupational Safety & Health are continuing. Manufacturers of the herbicide have repeatedly denied any liability.

Judge Weinstein has chosen Aetna Life Insurance Co. to serve as claims administrator, and veterans can get claims information from a toll-free telephone number, 1-800-645-1355.

David Hanson

High price tag seen for cleanup of nuclear sites

The taxpayers of America are facing a bill for tens of billions of dollars to bring nuclear weapons facilities and test sites into compliance with current environmental laws. If more stringent laws are enacted the cost will be much higher.

In a new report the Department of Energy estimates that at least \$40 billion and perhaps more than \$70 billion will be needed to control air and water pollution and clean up contaminated soil at its nuclear sites. That's in addition to the \$700 million per year DOE is already spending on its environment, safety, and health programs. And the estimates do not include the cost of disposing of the highly radioactive waste by-products of weapons production or of decontaminating weapons reactors once their useful life is over.

The report was requested over a year ago by Sen. John Glenn (D.-Ohio), chairman of the Senate Governmental Affairs Committee. In releasing the report, Glenn said that "it puts a price tag on the shameful

neglect of DOE and its predecessor agencies toward the health and safety of the public." Previous, less exhaustive studies have reckoned a much higher price tag than DOE's estimate.

In the report DOE notes that increasingly stringent requirements are being applied to facilities that were designed and constructed in the 1940s and 1950s when national security was the primary concern and there was little understanding of the scope and impact of then-acceptable industrial operations on the environment. Still, it says many of today's requirements could be met within five to 10 years, and almost all within 20 years, "if adequate funds are made available."

That's a big if. As DOE notes, a large number of requirements are being applied to defense facilities "at a time of considerable budgetary restraint. This poses a major challenge for DOE, the Congress, and the nation."

Janice Long

Cleanup of weapons facilities could cost \$70 billion plus

\$ Millions	1985-95	Post 1995	
		Expected	High
Savannah River Plant, Aiken, S.C.	\$ 3,662	\$ 1,149	\$ 8,880
Hanford Site, Richland, Wash.	2,435	27,030	46,130
Feed Materials Production Center, Fernald, Ohio	1,198	1,047	1,280
Y-12 Plant, Oak Ridge, Tenn.	1,094	340	680
Los Alamos National Laboratory, Los Alamos, N.M.	1,094	1,017	1,542
Nevada Test Site, Las Vegas, Nev.	634	250	750
Idaho National Engineering Laboratory, Idaho Falls, Idaho	633	515	2,060
Rocky Flats Plant, Golden, Colo.	576	120	190
Panlex Plant, Amarillo, Tex.	505	184	235
Lawrence Livermore National Laboratory, Livermore, Calif.	500	60	300
Kansas City Plant, Kansas City, Mo.	287	7	11
Sandia National Laboratories, Albuquerque, N.M.	232	55	70
Mound Plant, Miamisburg, Ohio	228	56	78
Pinellas Plant, Largo, Fla.	42	9	9
Sandia National Laboratories, Livermore, Calif.	29	1	3
TOTAL	\$13,149	\$31,842	\$62,168

Source: Department of Energy